

IN THE CLAIMS:

1. (Currently Amended) A copy engine comprising:
 - a first register to point to a first address;
 - a second register to point to a second address, wherein one of the first and second addresses is a source address and one is a destination address for data to be copied;
 - a control register, wherein the control register ~~includes:~~ comprises,
 - a count of ~~the~~ an amount of memory space required by a copy operation,
 - an indication of the direction of the copy operation as being one of from the first address to the second address ~~or~~ and from the second address to the first address, and
 - an indication of whether the first ~~memory~~ address is incremented or decremented.
2. (Original) A copy engine as claimed in claim 1, wherein the copy engine includes a locking mechanism for locking the copy engine during a copy operation.
3. (Original) A copy engine as claimed in claim 2, wherein the locking mechanism is locked by a write to the control register and unlocked when the copy operation completes.
4. (Original) A copy engine as claimed in claim 1, wherein a write to the second address triggers the copy operation during which the copy engine is in an active state.
5. (Original) A copy engine as claimed in claim 3, wherein an attempt to write to the control register while the locking mechanism is locked is retried until the current copy operation has completed.
6. (Original) A copy engine as claimed in claim 4, wherein an attempt to write to any register during the active state is retried until the current copy operation has completed.
7. (Currently Amended) A copy engine as claimed in claim 1, wherein the copy engine includes a ~~serialisation~~ serialization mechanism in which a write is made to the control register of zero count.

8. (Currently Amended) A copy engine as claimed in claim 1, ~~including multiple~~ comprising a plurality of sets of the first, second and control registers.

9. (Original) A copy engine as claimed in claim 8, wherein each set of registers can carry out copy operations simultaneously and can be locked independently.

10. (Original) A copy engine as claimed in claim 1, wherein an area of unused memory beyond the registers is provided to accommodate a cache line write to the registers.

11. (Currently Amended) A computer system comprising:

a central processing unit in which firmware is stored;

memory in which data is stored; and

a copy engine ~~which acts as an interface~~ coupled between the firmware and the memory;

and

~~wherein the copy engine is as claimed in claim 1~~

said copy engine comprising,

a first register to point to a first memory address;

a second register to point to a second memory address, wherein one of the first and second memory addresses is a source address and one is a destination address for data to be copied;

a control register, wherein the control register comprises,

a count of an amount of memory space required by a copy operation,

an indication of the direction of the copy operation as being one of from the first address to the second address and from the second address to the first address, and

an indication of whether the first address is incremented or decremented

12. (Currently Amended) A computer system as claimed in claim 11, wherein the computer system ~~includes~~ further comprises a write queue in which waiting copy operations ~~will~~ stack up behind a write of zero count and ~~the~~ waiting copy operations ~~will~~ execute ~~once~~ after the write of zero count has completed.

13. (Currently Amended) A copy engine comprising:

a first register to point to a first address;

a second register to point to a second address, wherein one of the first and second addresses is a source address and one is a destination address for data to be copied;

a control register, wherein the control register controls ~~the~~ addresses of a memory space;

a locking mechanism for locking the copy engine during a copy operation;

a ~~serialisation~~ serialization mechanism ~~in which~~ activated in response to a write of zeros ~~is made~~ to the control register;

wherein, if the copy engine is unlocked, the write of zeros ~~will execute~~ executes with no effect and, if the copy engine is locked, the write of zeros ~~will be~~ is retried until ~~the~~ a previous copy operation has completed and the write of zeros ~~will then complete~~ completes with no effect.

14. (Currently Amended) A copy engine as claimed in claim 13, wherein the control register includes a count of ~~the~~ an amount of memory space required by a copy operation and the write of zeros includes a zero count.

15. (Currently Amended) A copy engine as claimed in claim 13, ~~including multiple~~ comprising a plurality of sets of the first, second and control registers, wherein each set of registers ~~can be locked~~ is independently lockable.

16. (Currently Amended) A method of data movement comprising, ~~a copy engine~~:

maintaining a first register to point to a first address;

maintaining a second register to point to a second address, wherein one of the first and second addresses is a source address and one is a destination address for data to be copied;

using operating a control register to:

count ~~the~~ an amount of memory space required by a copy operation,

indicate ~~of the~~ a direction of the copy operation as being one of from the first address to the second address ~~or~~ and from the second address to the first address, and

indicate whether the first ~~memory~~ address is incremented or decremented.

17. (Currently Amended) A method as claimed in claim 16, wherein the method includes locking the copy engine during execution of a current copy operation.

18. (Currently Amended) A method as claimed in claim 17, wherein locking is activated by a write to the control register and deactivated by completion of the current copy operation.

19. (Currently Amended) A method as claimed in claim 16, wherein a write to the second address triggers the execution of the current copy operation during which the copy engine is in an active state.

20. (Original) A method as claimed in claim 18, wherein an attempt to write to the control register when locking is activated is retried until the current copy operation has completed.

21. (Original) A method as claimed in claim 19, wherein an attempt to write to any register during the active state is retried until the current copy operation has completed.

22. (Currently Amended) A method as claimed in claim 16, wherein the method includes ~~serialisation~~ serialization by making a write to the control register of zero count.

23. (Currently Amended) A method as claimed in claim 22, wherein at least one waiting copy ~~operations stack~~ operation stacks up behind a write of zero count and ~~the waiting copy operations~~ execute ~~once~~ after the write of zero count has completed.

24. (Currently Amended) A method as claimed in claim 16, wherein there are ~~multiple~~ a plurality of sets of first, second and control registers and each set of registers ~~carries~~ is operable to execute out copy operations simultaneously and is ~~locked~~ independently lockable.

25. (Currently Amended) A method as claimed in claim 16, wherein the method is carried out by a copy engine that is interposed between the memory and firmware.

26. (Currently Amended) A method as claimed in claim 16, wherein firmware allocates an area of memory as free memory space and ~~initialises~~ initializes the first register to point to the end of the free memory ~~pages~~ space in memory.

27. (Currently Amended) A method of data movement comprising:

maintaining a first register to point to a first address;
maintaining a second register to point to a second address, wherein one of the first and second addresses is a source address and one is a destination address for data to be copied;
using operating a control register to control a copy operation;
locking the set of the first, second and control registers during a copy operation;
serialising serializing copy operations by making a write of zeros to the control register;
wherein, if the set of registers is unlocked, the write of zeros ~~will execute~~ executes with no effect and, if the set of registers is locked, the write of zeros ~~will be~~ is retried until the current copy operation has completed and the write of zeros ~~will then complete~~ completes with no effect.

28. (Currently Amended) A method as claimed in claim 27, wherein waiting copy operations stack up behind a write of zeros and the waiting copy operations execute ~~once~~ after the write of zeros has completed.

29. (New) A computer program comprising computer executable program instructions stored in a computer readable media, comprising first program instructions to cause a computer agent to issue write operations to store in a copy engine, that is disposed external to the computer agent and coupled to a memory, a count value in a control register for indicating an amount of data to be copied, a first memory address in a first register and a second memory address in a second register, where storing a non-zero count value locks the control register, the first register and the second register from receiving a write operation from another computer agent, and where storing the second memory address initiates execution of a copy operation.

30. (New) A computer program as in claim 29, where said first program instructions further store in said control register a swap value for enabling a byte swapping operation to be performed on data being copied.

31. (New) A computer program as in claim 29, where said first program instructions further store in said control register a copy direction value for specifying a direction that copy data is to flow between the first memory address and the second memory address.

32. (New) A computer program as in claim 29, where said first program instructions further store

in said control register a value for indicating whether memory addresses are incremented or decremented during the copy operation.

33. (New) A computer program as in claim 32, further comprising second program instructions that use said value that indicates whether memory addresses are incremented or decremented to maintain at least one stack in the memory.

34. (New) A computer program as in claim 29, further comprising second program instructions to cause the computer agent to issue a write operation to store a count value of zero in the control register to serialize the use of the copy engine with other operations.

35. (New) A computer program as in claim 29, where the source memory address and the destination memory address are 4-byte aligned.

36. (New) A computer program as in claim 29, where the write operations are issued in a burst from an internal cache of the computer agent.